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EXAMINER	
YANG, RYAN R	

ART UNIT	PAPER NUMBER
2672	

DATE MAILED: 09/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/592,734	KOYAMA, FUMIO	
	Examiner	Art Unit	
	Ryan R Yang	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 22 July 2004.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-4,7-10 and 13-32 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) 13-20 is/are allowed.

6)☒ Claim(s) 1-4,7-10 and 21-32 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to communications: Request for Reconsideration, filed on 7/22/2004. This action is final.

2. Claims 1-4, 7-10 and 13-32 are pending in this application. Claims 1, 7, 13, 17, 21 and 27 are independent claims.

3. The present title of the invention is "Color correction in image display" as filed originally.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5 Claims 1, 7, 21 and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by Naito et al. (6,704,008).

As per claim 1, Naito et al., hereinafter Naito, discloses an image display apparatus comprising:

an image processor for outputting image data including plural color component data (Figure 1- 10 is an image processor; "the image display apparatus 10 has three liquid crystal panels 150 for three colors (RGB)", column 3, line 47-48);

a gain corrector for correcting chromaticity levels of the image data output by the image processor (Figure 1- 130 is a gain corrector); and

an image display device having pixels each emitting a plurality of colored light rays for forming a color image in accordance with the corrected image data corrected by the gain corrector (Figure 1- SC is a display screen displaying corrected image), wherein

the gain corrector corrects a respective level of at least one of the plural color component data applied to each respective pixel in the image display device based on measured luminance levels at each respective pixel such that, when image data representing an image of a uniform color are output from the image processor, a difference in chromaticity of light exiting from the pixels due to characteristics difference between the pixels of the image display device is reduced (Figure 2 shows color correction for each of RGB color of each pixel, where DD(P2) (equation 3) is data correction value for each pixel; Figure 5- S130 measures luminance level for correction).

6. As per claim 7, Naito discloses an image display method comprising:

providing image data including plural color component data (Figure 1- 10 is an image processor; "the image display apparatus 10 has three liquid crystal panels 150 for three colors (RGB)", column 3, line 47-48);

correcting chromaticity levels of the image data (Figure 1- 130 is a gain corrector for correcting chromaticity levels); and

producing light representing an image at a plurality of pixels of an image display device, each pixel emitting a plurality of colored light rays for forming a color image in accordance with the corrected image data (Figure 1- SC is a display screen displaying corrected image), wherein

the correcting step comprises correcting a respective level of at least one of the plural color component data applied to each respective pixel in the image display device based on measured luminance levels at each respective pixel such that, when image data representing an image of a uniform color are output from the image processor, a difference in a chromaticity of light exiting from the pixels due to characteristic differences between the pixels of the image display device is reduced (Figure 2 shows color correction for each of RGB color of each pixel, where DD(P2) (equation 3) is data correction value for each pixel; Figure 5- S130 measures luminance level for correction).

7. As per claim 21, Naito discloses an image display apparatus comprising:

an image processor for outputting image data including plural color component data (Figure 1- 10 is an image processor; "the image display apparatus 10 has three liquid crystal panels 150 for three colors (RGB)", column 3, line 47-48);

a gain corrector for correcting chromaticity levels of the image data output by the image processor (Figure 1- 130 is a gain corrector for correcting chromaticity levels); and

an image display device having a plurality of pixels each emitting a plurality of colored light rays for forming a color image in accordance with the corrected image data

corrected by the gain corrector (Figure 1- SC is a display screen displaying corrected image), wherein

the gain corrector corrects a respective level of at least one of the plural color component data applied to each respective pixel in the image display device based on measured luminance levels at each respective pixel such that, when image data representing an image of a uniform color are output from the image processor, a difference in chromaticity of light exiting from the pixels due to characteristic differences between the pixels of the image display device is reduced without making luminance of the light exiting from the pixels of the image display device conform to a desired smooth luminance profile throughout the image display device (Figure 2 shows color correction for each of RGB color of each pixel, where DD(P2) (equation 3) is data correction value for each pixel; Figure 5- S130 measures luminance level for correction; since Figure 1- 170 memory stores can store correction data, the image can conform to a desired smooth luminance profile throughout the image display device without measuring luminance of the light from the pixels of the image display device).

8. As per claim 27, Naito discloses an image display method comprising:

providing image data including plural color component data (Figure 1- 10 is an image processor; "the image display apparatus 10 has three liquid crystal panels 150 for three colors (RGB)", column 3, line 47-48);

correcting chromaticity levels of the image data (Figure 1- 130 is a gain corrector for correcting chromaticity levels); and

producing light representing an image at a plurality of pixels of an image display device, each pixel emitting a plurality of colored light rays for forming a color image in accordance with the corrected image data (Figure 1- SC is a display screen displaying corrected image), wherein

the correcting step comprises correcting a respective level of at least one of the plural color component data applied to each respective pixel in the image display device based on measured luminance levels at each respective pixel such that, when image data representing an image of a uniform color are output from the image processor, a difference in a chromaticity of light exiting from the pixels due to characteristic differences between the pixels of the image display device is reduced without making luminance of the light exiting from the pixels of the image display device conform to a desired smooth luminance profile throughout the image display device (Figure 2 shows color correction for each of RGB color of each pixel, where DD(P2) (equation 3) is data correction value for each pixel; Figure 5- S130 measures luminance level for correction; since Figure 1-170 memory stores can store correction data, the image can conform to a desired smooth luminance profile throughout the image display device without measuring luminance of the light from the pixels of the image display device).

Claim Rejections - 35 USC § 103

9. Claims 2-4 and 8-10, 22-24, 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naito et al. (6,704,008) in view Muraji (US 5,260,797).

10. As per claim 2, Naito demonstrated all the elements as applied in the rejection of independent claim 1, supra.

Naito discloses an image display correction device. It is noted that Naito does not explicitly disclose the gain corrector corrects the chromaticity levels of all but a specific one of the plural color component data applied to the pixels to reduce difference in level between the specific color component data and the other color component data, however, this is known in the art as taught by Muraji et al., hereinafter Muraji. Muraji discloses "The red and blue color component signals of an input video signal are corrected independently of one another so that their luminance is commensurate with that of the green color component signal" (column 2, line 52-55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Naito because Naito discloses an image display correction device and Muraji discloses the colors can be individually corrected in order to precisely adjust each color.

11. As per claim 3, Naito and Muraji demonstrated all the elements as applied in the rejection of claim 2, supra, and Muraji further discloses the specific color component data is a color component data that makes a greatest contribution to the luminance of the light for forming the image ("the green color component signal", column 2, line 55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Naito because Naito discloses an image display correction device and Muraji discloses the colors that makes the greatest contribution should be adjusted in order to make a proper adjustment of the color.

12. As per claim 4, Naito and Muraji demonstrated all the elements as applied in the rejection of claim 3, supra, and Miraji further discloses the plural color component data are red, green ,and blue component data, and the specific color component data is the green component data ("The red and blue color component signals of an input video signal are corrected independently of one another so that their luminance is commensurate with that of the green color component signal", column 2, line 52-55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Naito because Naito discloses an image display correction device and Muraji discloses the colors that makes the greatest contribution should be adjusted in order to make a proper adjustment of the color.

13. As per claim 8, Naito demonstrated all the elements as applied in the rejection of independent claim 7, supra.

Naito discloses a method of correcting image. It is noted that Naito does not explicitly disclose the step of correcting the level of at least one of the plural color component data includes the step of correcting the levels of all but a specific one of the plural color component data applied to the pixels to reduce difference in level between the specific color component data and the other color component data, however, this is known in the art as taught by Muraji et al., hereinafter Muraji. Muraji discloses "The red and blue color component signals of an input video signal are corrected independently of one another so that their luminance is commensurate with that of the green color component signal" (column 2, line 52-55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Naito because Naito discloses a method of correcting image and Muraji discloses the colors can be individually corrected in order to precisely adjust each color.

14. As per claim 9, Naito demonstrated all the elements as applied in the rejection of dependent claim 8, supra, and Muraji further discloses the specific color component data is a color component data that makes the greatest contribution to the luminance of the light for forming the image ("the green color component signal", column 2, line 55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Naito because Naito discloses an image display correction device and Muraji discloses the colors that makes the greatest contribution should be adjusted in order to make a proper adjustment of the color.

15. As per claim 10, Naito and Muraji demonstrated all the elements as applied in the rejection of dependent claim 9, supra, and Muraji further discloses the plural color component data are red, green, and blue component data, and the specific color component data is the green component data ("The red and blue color component signals of an input video signal are corrected independently of one another so that their luminance is commensurate with that of the green color component signal", column 2, line 52-55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Naito because Naito

discloses an image display correction device and Muraji discloses the colors that makes the greatest contribution should be adjusted in order to make a proper adjustment of the color.

16. As per gain 22, Naito demonstrated all the elements as applied in the rejection of independent claim 21, supra.

Naito discloses an image display correction device. It is noted that Naito does not explicitly disclose the gain corrector corrects the chromaticity levels of all but a specific one of the plural color component data applied to the pixels to reduce difference in level between the specific color component data and the other color component data, however, this is known in the art as taught by Muraji et al., hereinafter Muraji. Muraji discloses "The red and blue color component signals of an input video signal are corrected independently of one another so that their luminance is commensurate with that of the green color component signal" (column 2, line 52-55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Naito because Naito discloses an image display correction device and Muraji discloses the colors can be individually corrected in order to precisely adjust each color.

17. As per claim 23, Naito and Muraji demonstrated all the elements as applied in the rejection of claim 22, supra, and Muraji further discloses the specific color component data is a color component data that makes a greatest contribution to the luminance of the light for forming the image ("the green color component signal", column 2, line 55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Naito because Naito discloses an image display correction device and Muraji discloses the colors that makes the greatest contribution should be adjusted in order to make a proper adjustment of the color.

18. As per claim 24, Naito and Muraji demonstrated all the elements as applied in the rejection of claim 23, supra, and Miraji further discloses the plural color component data are red, green and blue component data, and the specific color component data is the green component data ("The red and blue color component signals of an input video signal are corrected independently of one another so that their luminance is commensurate with that of the green color component signal", column 2, line 52-55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Naito because Naito discloses an image display correction device and Muraji discloses the colors that makes the greatest contribution should be adjusted in order to make a proper adjustment of the color.

19. As per claim 28, Naito demonstrated all the elements as applied in the rejection of independent claim 27, supra.

Naito discloses a method of correcting image. It is noted that Naito does not explicitly disclose the step of correcting the level of at least one of the plural color component data includes the step of correcting the levels of all but a specific one of the plural color component data applied to the pixels to reduce difference in level between

the specific color component data and the other color component data, however, this is known in the art as taught by Muraji et al., hereinafter Muraji. Muraji discloses "The red and blue color component signals of an input video signal are corrected independently of one another so that their luminance is commensurate with that of the green color component signal" (column 2, line 52-55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Naito because Naito discloses a method of correcting image and Muraji discloses the colors can be individually corrected in order to precisely adjust each color.

20. As per claim 29, Naito demonstrated all the elements as applied in the rejection of claim 27, supra.

Naito discloses a method of correcting image. It is noted that Naito does not explicitly disclose the specific color component data is a color component data that makes a greatest contribution to the luminance of the light for forming the image, however, this is known in the art as taught by Muraji. Muraji discloses "the green color component signal" (column 2, line 55).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Muraji into Naito because Naito discloses an image display correction device and Muraji discloses the colors that makes the greatest contribution should be adjusted in order to make a proper adjustment of the color.

21. Claims 25-26 and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naito et al. in view of Hideo (JP 11-113019).

22. As per claim 25, Naito demonstrated all the elements as applied in the rejection of independent claim 21, supra,

Naito discloses an apparatus for correcting non-uniformity of an image display, it is noted that Naito does not explicitly disclose correction values for apex pixels corresponding to apexes of the small blocks are determined in advance, and correction values of pixels other than the apex pixels in each small areas are interpolated from the correction values of the apex pixels of the small area, however, this is known in the art as taught by Hideo. Hideo discloses in Figure 10, where the coordinates of the four corner position G(Xn,Yn) and correction values are entered and correction values are interpolated.

Thus, it would have been obvious to one of ordinary skill in the art to incorporate the teaching of Hideo into Naito because Naito discloses an image display apparatus and Hideo discloses an image correction method by segmenting the display area in order to form a smoother corrected image.

23. As per claim 26, Naito and Hideo demonstrated all the elements as applied in the rejection of independent claim 25, supra, and Hideo further discloses the plurality of pixels are segmented into the plurality of small areas by a horizontal axis passing through a center pixel among the multiple pixels, a vertical axis passing through the center pixel, and defining the sides of a rhombus whose apexes are the extremities of

the horizontal axis and the vertical axis (Figure 4, where a square is a special case of a rhombus).

Thus, it would have been obvious to one of ordinary skill in the art to incorporate the teaching of Hideo into Naito because Naito discloses an image display apparatus and Hideo discloses an image correction method by segmenting the display area in order to form a smoother corrected image.

24. As per claim 31, Naito demonstrated all the elements as applied in the rejection of independent claim 27.

Naito discloses a method for correcting non-uniformity of an image display, it is noted that Naito does not explicitly disclose the display is segmented and correction values are interpolated form the apex values, however, this is known in the art as taught by Hideo. Hideo discloses an image display correction method in which the plurality of pixels are segmented into a plurality of small areas of polygonal shape (see Figure 4); correction values for apex pixels corresponding to apexes of the small blocks are determined in advance, and correction values of pixels other than the apex pixels in each small areas are interpolated from the correction values of the apex pixels of the small area (Figure 10, where the coordinates of the four corner position G(Xn,Yn) and correction values are entered).

Thus, it would have been obvious to one of ordinary skill in the art to incorporate the teaching of Hideo into Naito because Naito discloses an image display apparatus and Hideo discloses an image correction method by segmenting the display area in order to form a smoother corrected image.

25. As per claim 32, Naito and Hideo demonstrated all the elements as applied in the rejection of dependent claim 31, supra, and Hideo further the plurality of pixels are segmented into the plurality of small areas by a horizontal axis passing through a center pixel among the multiple pixels, a vertical axis passing through the center pixel, and defining the sides of a rhombus whose apexes are the extremities of the horizontal axis and the vertical axis (Figure 4, where a square is a special case of a rhombus).

Thus, it would have been obvious to one of ordinary skill in the art to incorporate the teaching of Hideo into Naito because Naito discloses an image display apparatus and Hideo discloses an image correction method by segmenting the display area in order to form a smoother corrected image.

Response to Arguments

26. Applicant's arguments with respect to claims 1, 7, 21 and 27 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

27. Claims 13-20 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

As per claims 13 and 17, the closest prior art by Hideo does not disclose segmenting a plurality of triangular areas in correcting values of pixels.

Conclusion

28. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

29. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

30. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Ryan Yang** whose telephone number is **(703) 308-6133**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Michael Razavi**, can be reached at **(703) 305-4713**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 305-47000377.

Ryan Yang
9/17/2004

MICHAEL RAZAVI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600